CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO.
CONSTRUCTION, OPERATION AND MONITORING
SAN JOAQUIN COUNTY DEPARTMENT OF PUBLIC WORKS
NORTH COUNTY LANDFILL
CLASS III LANDFILL
SAN JOAQUIN COUNTY

This monitoring and reporting program (MRP) is issued pursuant to California Water Code section 13267 and incorporates requirements for landfill monitoring and maintenance contained in California Code Regulations title 27, division 2 (Title 27), Waste Discharge Requirements (WDRs) Order No. ___, and the April 2000 Standard Provisions and Reporting Requirements (SPRR). Compliance with this MRP is ordered by the WDRs. The Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Executive Officer. Regulatory sections quoted in the text and titles of this MRP refer to Title 27 unless otherwise noted.

Pursuant to Sections 20415(b)(1)(B) and 20420, the Discharger shall maintain water quality monitoring systems for background and detection monitoring, as set forth below.

MRP SUMMARY TABLE

Section	***Requirement***	***Frequency***
A.	Standard Observations	Monthly
B.	Facility Monitoring:	
	1. Maintenance Inspections	Monthly
	2. After Significant Storm Events	Within 7 Days After Event
	3. Site Winterization	Annually
C.	Water Quality Protection Standard	Update as necessary
D.	Leachate Monitoring	
	1. LCRS Sumps	Monthly/Semiannually
	2. Secondary Sumps	Quarterly/Semiannually
E.	Unsaturated Zone Monitoring	
	1. Soil Gas	Quarterly
	2. Pore Water	Semiannually
F.	Groundwater Monitoring	
	1. Elevation	Quarterly
	2. Background Monitoring	Semiannually
	3. Detection Monitoring	Semiannually
	4. Constituents of Concern	Every 5 years
G.	Surface Water Monitoring:	
	1. Storm Water	Semiannually
	2. South Paddy Creek	Semiannually
H.	Reporting	
	1. Semiannual Report[1]	Semiannually
	2. Annual Monitoring Summary	Annually
	3. Constituents of Concern (COCs)	Every 5 years

Section	*Requirement*	*Frequency*
	4. Notifications[2]	Within 7 days

1. Including certification of standard observations
2. In event of release or leachate seep.

A. STANDARD OBSERVATIONS

1. Definition

Standard Observations shall include the following:

a. For the Unit:
   1) Evidence of ponded water at any point on the facility (show affected area on map);
   2) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
   3) Evidence of erosion and/or of day-lighted refuse.

b. Along the perimeter of the Unit:
   1) Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);
   2) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
   3) Evidence of erosion and/or of day-lighted refuse.

c. For receiving waters:
   1) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area;
   2) Discoloration and turbidity - description of color, source, and size of affected area;
   3) Evidence of odors - presence or absence, characterization, source, and distance of travel from source;
   4) Evidence of water uses - presence of water-associated wildlife;
   5) Flow rate; and
   6) Weather conditions - wind direction and estimated velocity, total precipitation during recent days and on the day of observation.

2. Monitoring Requirements

Standard observations of the site (e.g., landfill cover, perimeter ditches, sedimentation basin, South Paddy Creek) shall be performed **weekly** and recorded in field logs. Any landfill leachate seeps detected during these inspections (or at any other time) shall be reported in accordance with WDR Reporting Requirement F.5, and any leachate that enters a module excavation

area or facility drainage system shall be sampled and analyzed for the COCs referenced in Table C.1 herein.

B. FACILITY MONITORING

The discharger shall inspect the landfill and associated facilities (e.g., cover, precipitation and drainage controls, gas extraction system, monitoring wells, access roads), as necessary, to ensure that such facilities are functioning properly and are in adequate maintenance and repair. Any damage to the landfill facilities observed during these inspections shall be flagged and repaired. Facility inspections and repairs shall be conducted in accordance with the following schedule:

	Purpose	Inspection Frequency	Complete Repairs[1]
1.	Regular Maintenance	Monthly	Within 30 days
2.	Storm Response	Within one week of significant storm event[2]	Within two weeks of storm event
3.	Site Winterization	By September 30 of each year	By October 31 of each year

1. If necessary repairs cannot be completed within specified time frame, the Discharger shall, within 7 days, notify the Regional Water Board and provide a schedule for completing them.
2. A "significant" storm event shall be one that produces 1.4 inches or more of precipitation within a 24-hour period, as measured at the Linn Ranch Station.

The results of these inspections, including documentation of any significant damage and/or repairs (e.g., field logs, site map showing location of damage, before and after photos) shall be included in the semiannual monitoring report for the period and summarized in the Annual Report. If no inspection and/or repairs were conducted as required above, the report shall so state, providing the reason and circumstances (e.g., no significant storm event during monitoring period).

C. WATER QUALITY PROTECTION STANDARD (Section 20390)

The Water Quality Protection Standard (WQPS) shall consist of all Constituents of Concern (COCs), Concentration Limits (CLs) for each COC, Monitoring Points, Point of Compliance, and the Compliance Period.

1. **Constituents of Concern (Section 20395)**
   The COC list includes all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit. The COCs for all monitored waters at the site (i.e., unsaturated zone, groundwater, and surface water) shall be as listed in Tables G.1 and G.2, which are incorporated herein and made part of this Order by reference. The COC list groups are as follows:

Table C.1

Constituents of Concern	Units	Test Method
Field Parameters	As specified in Table G.1	
Inorganic:		
General Minerals	mg/L	See Table G.1
Dissolved Metals	µg/L	See Table G.1
Organic:		
Volatile Organic Compounds	µg/L	USEPA Method 8260B
Semi-Volatile Organic Compounds	µg/L	USEPA Method 8270
Organophosphorus Pesticides	µg/L	USEPA Method 8141A
Chlorinated Herbicides	µg/L	USEPA Method 8151
Organochlorine Pesticides	µg/L	USEPA Method 8081A
Polychlorinated Biphenols (PCBs)	µg/L	USEPA Method 8082

2. **Concentration Limits (Section 20400)**

Statistical CLs shall be developed and updated using historical background monitoring data. Data analysis shall be in accordance with WDR Monitoring Specifications E.20 and E.22.a using an "interwell comparisons" approach (e.g., comparing downgradient with upgradient, or downstream with upstream). CLs for nonstatistical COCs shall be developed and updated, as applicable, in accordance with WDR Monitoring Specifications E.21, E.22.b, and E.23.

a. Unsaturated Zone

CLs not yet developed due to lack of liquid recovery from lysimeters. CLs shall be developed (and updated thereafter) once a sufficient amount of background monitoring data has been collected under Section E.2 herein.[1]

b. Groundwater

i. Statistical CLs

CLs for general minerals (specified in Table G.1) were calculated using the interwell tolerance method. CLs for dissolved metals have not yet been developed due to limited background monitoring data (9 events). Interim CLs for 11 out of 24 dissolved metals tentatively identified as statistical COCs are listed in Table G.1. Revised CLs for these dissolved metals shall be developed once additional background monitoring has been conducted for these constituents per Section F.2.c herein.

ii. Nonstatistical CLs

Interim CLs for the remaining 13 dissolved metals (i.e., those not detected in any of the 9 monitoring events) and CLs for VOCs and other organic COCs were set equal to the MDL.

1. WDR Provision G.8.b requires that the Discharger investigate the lysimeters and submit a workplan for any repairs that may be necessary to ensure that they are in good working order.

c. Surface Water

CLs for statistical COCs shall be based on either of the following:

i. Concurrent upstream monitoring data; and/or
ii. Statistical analysis of historical upstream monitoring data (assumed for interim CLs under this Order).

Interim statistical CLs based on available monitoring data from sampling point S-1 are provided in Table G.1. Revised CLs for these dissolved metals shall be developed once additional background monitoring has been conducted for these constituents under Section G.2 herein.

3. **Monitoring Points (Section 20405)**
The monitoring points for unsaturated zone, groundwater, and surface water monitoring shall be as specified in Sections E.2; F.2 and 3; and G.2, respectively.

4. **Point of Compliance (Section 20405)**
Title 27 defines the Point of Compliance (POC) as a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the Unit.

a. Unsaturated Zone

The POC probes for the unsaturated zone shall consist of all existing and future lysimeters installed along the landfill perimeter, as referenced in Section E.2 herein.

b. Groundwater

The POC groundwater wells shall consist of the following:

i. All downgradient (and cross gradient) landfill perimeter wells, including Gs-2, 3D, 4, 5 and 6;
ii. All upgradient perimeter wells within the zone of influence of LFG (e.g., G-1);
iii. Any future wells that meet either (or both) of the criteria in 4a and 4b.

c. Surface Water– downstream monitoring point S-3 (see Section G.2).

5. **Compliance Period (Section 20410)**
The compliance period (the minimum period for a landfill during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the Unit) is equal to the active life of the Unit plus the closure period. The compliance period shall be as follows:

a. The landfill began operations in 1991 and is projected to close in 2050. The compliance period is therefore 59 years.

b. If the landfill is in corrective action at the scheduled end of the compliance period, the compliance period shall be extended until the discharger can demonstrate that the Unit has been in continuous compliance with its WQPS for a period of at least three consecutive years, including proof period under

Section 20430(f). See WDR Monitoring Specification E.32.

Note: WDR Provision G.12 requires that the Discharger submit an updated WQPS report that includes updated WQPS component information for each of the above monitored media by **31 July 2012.**

D. LEACHATE MONITORING

1. **LCRS Sumps**
   a. Monitoring Points – Modules 1, 3, 4 and future modules
   b. Monitoring Parameters & Schedule

      All LCRS sumps shall be inspected **at least monthly** for leachate generation and monitored (i.e., sampled) in accordance with the parameters and frequencies of Section F.3.c (except quarterly elevation monitoring shall be replaced with monthly volume monitoring). Until such time as they are upgraded with automatic controls (required **within two years** of adoption of this Order under WDR Facility Specification C.4), manually operated LCRS sumps shall be pumped dry **twice per week** and the volumes removed recorded. Volumes pumped from automatically operated sumps shall also be recorded.

2. **Secondary Sumps**
   a. Monitoring Points – same as D.1.a.
   b. Monitoring Parameters & Schedule

      All secondary sumps shall be inspected **at least quarterly** for the presence of liquid. Notice to Regional Water Board shall be same as in response to a release (i.e., within 7 days). Any liquid detected in sump shall be removed after completion of sampling. Monitoring shall be in accordance with Section F.3.c, except that the volume detected (and removed) shall also be measured.

E. UNSATURATED ZONE MONITORING

1. **Soil Gas**
   The Discharger shall monitor soil gas for LFG to assess its ongoing potential as source of impacts to groundwater and the effectiveness of LFG extraction as a corrective action measure in mitigating such source.

   b. Monitoring Points

      Soil gas monitoring points shall include triple complete perimeter probes SGs-1, 2, 3, 8, 9 and 10 (including shallow, intermediate and deep probes) and single complete interior probes (SGs-4, 5, 6 and 7). Soil gas monitoring points shall also include any future soil gas probes installed along the unit perimeter to monitor the landfill.

   c. Monitoring Parameters & Schedule

The soil gas monitoring parameters and schedule shall be as follows:

Parameter	Units	Frequency	Method
Gas Pressure	psig	Quarterly	Meter
Ambient Temperature	^oC, ^oF	Quarterly	Meter
Methane	%	Quarterly	Meter
Carbon Dioxide	%	Quarterly	Meter
VOCs[1]	ppbv	Semiannually	EPA Method TO-15 or 8260B

1. Sampling may be limited to deepest probes surrounding the landfill footprint (i.e., interior probes and deep probes of SGs-1, 2 and 3)

Field meters shall be calibrated for each parameter before use. Field and calibration logs for each monitoring event shall be included in each monitoring report.

2. **Pore liquid Monitoring**

The Discharger shall monitor soil pore liquid as follows:

a. Monitoring Points

Lysimeter	Type	Location
VZ-1	Background	Undeveloped area near G-1
VZ-2	Detection	SW perimeter Module 1, NW perimeter Module 3
VZ-3	Detection	NW perimeter Module 1
VZ-4	Detection	Northern perimeter, Module 1
VZ-6, 7	Detection	Under Module 4 (western half)
VZ- 8	Detection	Under Module 4 (eastern half)

1. Lysimeters installed in shallow soil beneath lined excavation slopes.

Lysimeter monitoring locations shall also include future lysimeters installed to monitor future expansion modules per WDR Construction Specification D.5.c. Pore liquid monitoring shall also include any lysimeters or other monitoring devices beneath leachate collection sumps.

b. Monitoring Parameters & Schedule

The pore liquid monitoring shall be conducted **monthly.** Any liquid recovered shall be analyzed in accordance with the parameters in Section F.3.c, except that volume of liquid recovered shall be recorded in lieu of elevation. In the event that a release is tentatively indicated, the Discharger shall proceed with confirmation sampling under WDR Monitoring Specification E.27, and follow

the Response to Release requirements of the WDRs and SPRR, as indicated. The Discharger shall also consider whether the detection of liquid in the lysimeter constitutes significant physical evidence of a release under WDR Monitoring Specification E.30.

F. GROUNDWATER MONITORING

1. Elevation Monitoring (Section 20415(e)(13))

The groundwater surface elevation (in feet and hundredths, MSL) in all wells and piezometers shall be measured on a **quarterly** basis. Groundwater elevations taken prior to purging the well and sampling for Monitoring Parameters may be used to fulfill this requirement. Groundwater elevations for all monitoring wells for a given groundwater body shall be measured within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater gradient and direction. The results of groundwater elevation monitoring shall be displayed on a water table contour map and/or groundwater flow net for the site and included in each monitoring report. The Discharger shall use the groundwater elevation monitoring data to estimate the following, as feasible:

a. The groundwater flow velocity
b. The gradient direction in the upper aquifer, and in any additional zone of saturation monitored pursuant to this MRP
c. Times of highest and lowest elevations of the water levels in the wells
d. Separation of groundwater from the lowest point of the unit

Each of these estimations shall be included in the semi-annual reports.

2. Background Monitoring (Section 20415(b)(1)(A))

Background monitoring shall be performed for the purpose of developing and updating concentration limits as described in Section C.2.

a. Monitoring Points

The Discharger shall install and operate a sufficient number of background monitoring wells at appropriate locations and depths to yield ground water samples from the uppermost aquifer that represent the quality of ground water that has not been affected by a release from the unit. The background monitoring system may include wells that are not hydraulically upgradient of the Unit if:

i. Samples from such wells are more representative than those provided by upgradient wells; or

ii. Installation of an upgradient background well is not feasible; and

iii. It can be demonstrated that samples from such wells are representative of background groundwater quality.

The background monitoring points for groundwater shall be as specified in Section F.3.a herein.

b. Monitoring Parameters - See Section F.3.b.

c. Monitoring Schedule

The background monitoring schedule shall be as specified in Section F.3.c herein, except for five-year inorganic COCs (i.e., dissolved metals) for which concentration limits have not yet been developed. For such COCs, background monitoring shall be conducted annually until a sufficient amount of data has been collected for statistical (or nonstatistical) determination of concentration limits. Thereafter, such monitoring may be reduced to every five years in accordance with Section F.3.c.

3. **Detection Monitoring (Sections 20415(b)(1)(B) and 20420)**

The Discharger shall install, operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of Sections 20415 and 20420 of Title 27. Such system shall be appropriate for detecting, at the earliest possible time, a release to groundwater from the Unit. Detection monitoring (and any evaluation and/or corrective action monitoring required in the event of a release) shall be conducted in compliance with WDR Monitoring Specifications E.1 through 33, as applicable.

a. Monitoring Points - The groundwater detection monitoring points shall be as follows:

Table F.3.a: Monitoring Points

Module	Well	Orientation	Location
1	G-5	Down gradient	NW unit perimeter
1, 3	G-3D	Down gradient	Western site perimeter
3	G-4	Down gradient	Western unit perimeter
4	G-6	Down gradient	SW unit perimeter
All	G-1	Background	NE unit perimeter
All	G-2[1]	Side gradient	NW site perimeter

1. Well historically inactive. WDR Provision G.8.c requires status report, including plans for repair or replacement, as necessary.

The detection monitoring points shall further include any future onsite or offsite groundwater monitoring wells installed to monitor the facility. In the absence of an approved proposal to the contrary, all detection monitoring points shall become evaluation and corrective action monitoring points in the event of a confirmed release from the unit.

b. Monitoring Parameters

Monitoring parameters are constituents of concern that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit. The monitoring parameters for the landfill shall be as listed in Section F.3.c and Tables G.1 and G.2. Any five-year COC confirmed by retest (per WDR Monitoring Specification E.27) to be a constituent of a release shall also be added to the monitoring parameter list per Monitoring Specification E.29. In such cases, the Discharger shall also follow the Response to Release requirements of the WDRs and SPRR, as necessary.

c. Monitoring Schedule

A sufficient number of samples shall be taken from all monitoring points to satisfy the data analysis requirements for a given reporting period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Collection and analysis of samples shall be in accordance with procedures set forth in the SCAnP per WDR Monitoring Specification E.6. The groundwater monitoring schedule shall be as follows:

Table F.3.c:
Detection Monitoring Schedule

Parameter	Units	Frequency	Data Analysis
Field Parameters			
Elevation	Feet MSL	Quarterly	---
pH	pH units	Semiannually	Statistical
Temperature	^{O}C, ^{O}F	Semiannually	---
Turbidity	NTU	Semiannually	---
Dissolved Oxygen (DO)	%	Semiannually	---
Redox potential	millivolts	Semiannually	---
Specific Conductance	µMhos/cm	Semiannually	Statistical
Monitoring Parameters			
VOCs[1]	µg/L	Semiannually	Nonstatistical
General Minerals:			
Chloride	mg/L	Semiannually	Statistical
TDS	mg/L	Semiannually	Statistical
Total Alkalinity	mg/L	Semiannually	Statistical
Total Hardness	mg/L	Semiannually	Statistical
Chemical Oxygen Demand (COD)	mg/L	Semiannually	Statistical
Major Anions[1]	mg/L	Annually	Statistical
Major Cations[1]	mg/L	Annually	Statistical
Dissolved Metals	µg/L	Annually	Statistical/Nonstatistical

Parameter	Units	Frequency	Data Analysis
COCs[1,2]	See Table C	Every 5 years[3]	Statistical/Nonstatistical

1. See Tables G.1 and G.2 for full list of constituents and EPA test methods.
2. COC monitoring under this Order shall be conducted by **30 June 2010** and at least every five years thereafter.
3. More frequent monitoring may be required if concentration limits not yet developed. See Section F.2.c.

G. SURFACE WATER MONITORING (Section 20415(c))

1. Storm Water

The Discharger shall maintain coverage under the State Water Resources Control Board General Industrial Storm Water Permit, Water Quality Order No. 97-03-DWQ. The discharger shall also monitor storm water flows semiannually for the semiannual field and monitoring parameters specified in Table F.3.c. Sampling shall be conducted at the following discharge locations, as applicable (see Attachment B):

Sampling Point	Sampling Location	Source of Flow	Type
SW-1	SE Perimeter ditch	Offsite	Run-on
SW-2	Outfall to eastern perimeter ditch	ISB	Runoff
SW-3[1]	Outfall to South Paddy Creek - Upstream	Eastern Perimeter Ditch	Runoff
SW-4	Outfall to South Paddy Creek - Down stream	Western Perimeter Ditch	Runoff
SW-5[2]	SW Outfall to natural drain	Western Perimeter Ditch	Runoff
SW-6[2]	SW Outfall to natural drain	Southern perimeter ditch	Runoff

1. No sampling required at this monitoring point if, at time of sampling, only source of flow is that from SW-2.
2. Future discharge locations.

The results of storm water monitoring for these constituents shall be summarized in the monitoring reports submitted under this Order. If there is no discharge from the site during the monitoring period, or the Discharger did not obtain samples of the discharge, the Discharger shall state the reasons and circumstances in the monitoring report.

2. Surface Water

Surface water sampling shall be collected at upstream monitoring point S-1 and down stream monitoring points S-2 and S-3, as shown on Attachment B: Site

Map. Monitoring shall be conducted for the parameters and constituents, and at the corresponding frequencies, listed in Table F.3.c, except for Redox potential, which need not be monitored. Creek elevation may be estimated based on observation.

H. REPORTING

1. **Records**

The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility including the postclosure period. Such legible records shall show the following for each sample:

a. Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;

b. Date, time, and manner of sampling;

c. Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;

d. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;

e. Calculation of results; and

f. Results of analyses, and the MDL and PQL for each analysis.

2. **Semiannual Reports**

The Discharger shall report monitoring data and information as required in this MRP and as required under WDRs Order No. ___ and the SPRR. Monitoring reports shall be submitted **semiannually**. Each semiannual monitoring report shall include the following information:

a. A compliance summary for the monitoring period that includes:

i. A narrative summary of any **violations** that occurred during the monitoring period;

ii. The quantity and types of wastes discharged and the locations in the unit where waste has been placed since submittal of the last such report.

iii. A summary and certification of the completion of all Standard Observations.

iv. An evaluation of the effectiveness of all landfill control facilities, including, but not necessarily limited to, leachate, precipitation and drainage, and

landfill gas.

v. Maps and/or aerial photographs, as appropriate, showing relevant facility details, including the landfill and all monitoring locations.

b. A tabular summary of monitoring well information from the installation logs, including well name, top casing elevation, total well depth, relevant geologic information (e.g., soil type), aquifer(s) and zones (e.g., upper water bearing zone), and screened intervals (bgs and MSL).

c. **Groundwater elevation** monitoring results for each quarter, including:

i. A narrative description of groundwater flow at the site, including flow direction, gradient, and rate; and

ii. A groundwater elevation contour map approximately scaled and clearly labeled to show the information in H.2.c.i.

d. **Tabular summaries** of the monitoring results obtained during the period for each monitoring schedule herein. Tables shall have appropriate headers and show monitoring point, sampling date, constituent or parameter, concentration or measurement, units, and CLs, as applicable. Any exceedances of CLs shall be highlighted or otherwise clearly shown. Non-detect results shall indicate the applicable detection limit (e.g., "<0.3").

e. An **analysis of the monitoring data**, including the following:

i. Background Monitoring

1) Identifying historical trends

2) Developing/updating CLs for monitoring parameters and COCs, as appropriate

ii. Detection Monitoring

1) Comparing monitoring data with CLs to identify any exceedances

2) Retesting, as required, if release tentatively indicated.

3) Checking for previous similar or potentially related exceedances (e.g., sporadic, recurring) in same media.

4) Checking for similar or potentially related exceedances in other media (e.g., unsaturated zone).

5) Whether a release was indicated by physically significant evidence.

6) Whether a leak occurred in a sump or containment system.

iii. Graphics

1) Water chemistry analysis

⇒ Cation/anion balance
⇒ Graphs (e.g., Piper, Trilinear, Schueller, and/or Stiff plot)

2) Time series plots

⇒ Provide for each constituent for which there are three or more data

points, including non-detect values, at each monitoring point.

⇒ Data for multiple monitoring points, or multiple constituents, may be plotted on same graphic if scaling compatible.

⇒ Scale for maximum range of data (excluding outliers).

⇒ Use compatible graphics (e.g., symbols, line type, color, icon size) so each plot can be easily distinguished and read

⇒ Limit amount of information (e.g., number of constituents or monitoring points) on each graphic to maintain clarity

⇒ Use plotting program that reads sampling dates

3) Trend analysis

⇒ Provide for representative parameters/constituents for which there are four or more data points above the PQL, at each monitoring point.

⇒ Use appropriate graphical/statistical methods (e.g., Mann-Kendall, Sen's Slope, best fit).

Note: The above graphical methods may also be used to evaluate whether there has been a release under H.2.e.ii.

iv. Overall evaluation of the effectiveness of the detection monitoring program and need for additional measures, controls and/or monitoring wells.

1) Identification of potential sources of impacts and transport mechanisms

2) Discuss of evidence that detection monitoring program is or is not working.

v. In Event of Release:

1) Same as H.2.e.iii above.

2) Preparation of contaminant contour maps for representative constituents/parameters

The information above (H.2.a through H.2.e) shall be provided in the main body of the report, and the information below (H.2.f) in the appendix to the report.

f. Appendix Items

i. Field logs of Standard Observations

ii. Sample collection information for each monitoring point:

1) Time of water level measurement;

2) Type of pump (or other device) used for purging and the elevation of the pump intake relative to the elevation of the screened interval;

3) Method of purging (the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; the calibration of the field equipment; results of the pH,

temperature, conductivity, and turbidity testing; and the method of disposing of the purge water) to remove all portions of the water that was in the well bore while the sample was being taken;

4) Type of pump (or other device) used for sampling, if different than the pump or device used for purging; and

5) A statement verifying that the sampling procedure was conducted in accordance with the SCAnP.

iii. Field logs, chain of custody, and laboratory test sheets.

iv. Copies of other relevant reports or data (e.g., results of soil gas/LFG monitoring required by Local Enforcement Agency)

v. An electronic copy of the monitoring report on compact disk (CD) in (preferably combined) PDF format.

3. **Annual Monitoring Summary Report**

An Annual Monitoring Summary Report (Annual Report) shall also be prepared and submitted **annually**. The report may be submitted as part of the Second Semiannual Report for each year. The Annual Report shall include the following information:

a. A written summary of the monitoring results for the year, indicating any changes made or observed since the previous annual report.

b. A comprehensive discussion of the compliance record, including any necessary repairs, improvements, and/or corrective action measures implemented or planned to bring the Discharger into full compliance with the WDRs and WQPS.

c. Tabular and graphical summaries of the results of the prior year, including, representative time series plots.

d. A summary of the results of water chemistry analysis of water quality data collected during the prior year.

e. Appendix Items

i. A copy of the SCAnP as updated per WDR Monitoring Specification E.6 and the SPRR (Monitoring Specification X.B).

ii. Electronic copies of the following on CD

1) Historical monitoring data collected under this and previous MRPs

⇒ Provide in a tabular format necessary for statistical analysis (e.g., Excel) per Section 40420(h)

⇒ Provide for all monitoring systems, including leachate; LFG; soil gas; soil pore water; groundwater (including elevation, flow direction, gradient, and quality); surface water; and storm water.

⇒ Provide for at least previous 10 years (or for as long as monitoring has been conducted at a given monitoring point).

⇒ Organize tables as specified in H.2.d.

2) The monitoring report in (preferably combined) PDF format.

iii. Evidence to the Regional Board's Executive Officer that acceptable financial assurance instrument(s) have been provided for post-closure and corrective action (e.g., an acceptance letter from the CIWMB's Financial Assurance Division).

4. **Reporting Schedule**
The semiannual and annual reports shall be submitted to the Board in accordance with the following schedule for the calendar period in which samples were taken or observations made:

Table H.4

Report	End of Reporting Period	Date Report Due
First Semiannual	30 June	**31 July**
Second Semiannual	31 December	**31 January**
Annual Report	31 December	**31 January**

5. **Transmittal Letter**
A transmittal letter explaining essential points shall accompany each monitoring report. At a minimum, the transmittal letter shall:

a. Identify the enclosed monitoring report and monitoring period for which it is being submitted under the MRP. Also, identify the last monitoring report submitted under the MRP and monitoring period for which it was submitted.

b. State whether any WDR violations (including reporting violations) or exceedances of concentration limits have occurred during the monitoring period, or since the end of the monitoring period for which the last monitoring report was submitted; what those violations were; and how they have, or will be, corrected. If no such violations or exceedances have occurred, the transmittal letter shall so state.

c. State that a discussion of any such violations or exceedances, and a description of the actions taken or planned for correcting them (including any references to previously submitted time schedules), is contained in the enclosed report.

d. Comply with the signatory requirements of WDR Reporting Requirement F.6, including certification by the discharger (or the discharger's authorized agent) under penalty of perjury that, to the best of the signer's knowledge, the report is true, accurate and complete.

Reports that do not comply with the above-required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the WDRs.

The Discharger shall implement the above monitoring program on the effective date of this Program.

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

_____
(Date)

Attachments
JDM: 3 November 2009

INORGANIC CONSTITUENTS OF CONCERN (COCs),
APPROVED USEPA ANALYTICAL METHODS, & CONCENTRATION LIMITS

Table G.1

Constituent	USEPA Test Method	Concentration Limit[1] Unsaturated Zone	Ground-water	Surface Water[3]
Field Parameters				
Elevation, Ft. MSL	----	n/a	----	n/a
pH, pH units	150.1 or meter	----	≥6, ≤8	----
Temperature, ^{O}C, ^{O}F	----	----	----	----
Turbidity, NTU	----	----	18	209
Dissolved Oxygen	360.1 or meter	----	----	----
Oxidation-Reduction (Redox) Potential, mv	----	----	----	n/a
Specific conductance, µMhos/cm	120.1 or meter	----	450	695
General Minerals, mg/L				
Total Dissolved Solids (TDS)	2540C	----	300	468
Total Alkalinity	2320B	----	165[2]	334
Total Hardness	2340B	----	----	----
Chemical Oxygen Demand (COD)	410.4	----	----	565
Major Anions				
Bicarbonate	2310B	----	130	----
Chloride	300	----	40	61
Nitrate – Nitrogen	300	----	4	10
Sulfate	300	----	31	69
Major Cations				
Calcium	200.7/6010	----	31	----
Magnesium	200.7/6010	----	23	----
Potassium	200.7/6010	----	7	----
Sodium	200.7/6010	----	31	----
Dissolved Metals, µg/L[5]				
Aluminum	200.7/6010	----	210[2]	3,050
Antimony	200.7/6010	----	MDL	----
Arsenic	200.9/200.8	----	MDL	----
Barium	200.7/6010	----	90[2]	254
Beryllium	200.7/6010	----	MDL	----
Boron	200.7/6010	----	170[2]	----
Cadmium	200.7/6010	----	MDL	----

Chromium	200.7/6010	----	MDL	12
Hexavalent Chromium	7199/1636	----	----	----
Cobalt	200.7/6010	----	MDL	----
Copper	200.7/6010	----	MDL	140
Cyanide	335.4/9010	----	10[2]	----
Iron	200.9/200.8	----	620[2]	3,340
Lead	200.9/200.8	----	10[2]	----
Manganese	200.7/6010	----	2[2]	579
Mercury	7470A	----	MDL	----
Molybdenum	200.7/6010	----	MDL	----
Nickel	200.9/200.8	----	MDL	138
Selenium	200.9/200.8	----	MDL	----
Silver	200.7/6010	----	MDL	----
Sulfide	9030	----	750[2]	----
Thallium	200.7/6010	----	MDL	----
Tin	200.7/6010	----	MDL	----
Vanadium	200.7/6010	----	30[2]	81
Zinc	200.7/6010	----	36[2]	482

1. "----" means insufficient data to compute CL for this constituent.
2. Interim CL equal to 1.5 x highest concentration historically detected in background well, excluding outlier(s).
3. Interim CL set at 90% tolerance limit estimated by statistical analysis of historical upstream data, excluding outlier(s).
4. Samples shall be filtered prior to performing dissolved inorganics analysis.

ORGANIC COCs & APPROVED USEPA ANALYTICAL METHODS
(CONCENTRATION LIMITS = MDL)

Table G.2

Volatile Organic Compounds (VOCs)[1] (USEPA Method 8260B)
Acetone
Acetonitrile
Acrolein
Acrylonitrile
Allyl chloride (3-Chloropropene)
Tert-Amyl methyl ether
Benzene
Bromobenzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
Tert-Butyl alcohol

Table G.2

n-Butlybenzene
sec-Butlybenzene
tert-Butlybenzene
tert-Butyl ethyl ether
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Chloroprene
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans- l ,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC-12)
1,1-Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1-Dichloroethylene (1,1-Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
1,3-Dichloropropane
2,2-Dichloropropene
1,1-Dichloropropene
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Ethylbenzene
Ethyl methacrylate
Hexachlorobutadiene
Hexachloroethane
2-Hexanone (Methyl butyl ketone)
Iodomethane (Methyl iodide)
Isobutyl alcohol
di-Isopropyl ether
Methacrylonitrile
Methyl bromide (Bromomethene)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl chloride (Chloromethane)

Table G.2

Methyl ethyl ketone (MEK: 2-Butanone)
4-Methyl-2-pentanone (Methyl isobutylketone)
Methyl tert-butyl ether (MtBE)
Naphthalene
2-Nitropropane
n-Propylbenzene
Propionitrile
Styrene
1,1,1,2-Tetrachloroethane
1,1.2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloethane (Methylchloroforrn)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Vinyl chloride
Xylenes (total)

Semi-VOCs[1] (USEPA Method 8270 - base, neutral, & acid extractables):
Acenaphthene
Acenaphthylene
Acetophenone
2-Acetylaminofluorene (2-AAF)
4-Aminobiphenyl
Anthracene
Benzo[a]anthracene (Benzanthracene)
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[g,h,i]perylene
Benzo[a]pyrene
Benzyl alcohol
Bis(2-ethylhexyl) phthalate
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl) ether (Dichloroethyl ether)
Bis(2-chloro-1-methyethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)
4-Bromophenyl phenyl ether
Butyl benzyl phthalate (Benzyl butyl phthalate)
p-Chloroaniline
p-Chloro-m-cresol (4-Chloro-3-methylphenol)
2-Chloronaphthalene

Table G.2

2-Chlorophenol
4-Chlorophenyl phenyl ether
Chrysene
o-Cresol (2-methylphenol)
m-Cresol (3-methylphenol)
p-Cresol (4-methylphenol)
Dibenz[a,h]anthracene
Dibenzofuran
Di-n-butyl phthalate
3,3'-Dichlorobenzidine
2,4-Dichlorophenol
2,6-Dichlorophenol
Diethyl phthalate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3'-Dimethylbenzidine
2,4-Dimehtylphenol (m-Xylenol)
Dimethyl phthalate
m-Dinitrobenzene
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-octyl phthalate
Diphenylamine
Ethyl methanesulfonate
Famphur
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachloropropene
Indeno(1,2,3-c,d)pyrene
Isophorone
Isosafrole
Kepone
Methapyrilene
3-Methylcholanthrene
Methyl methanesulfonate
2-Methylnaphthalene
1,4-Naphthoquinone
1-Naphthylamine
2-Naphthylamine
o-Nitroaniline (2-Nitroaniline)
m-Nitroaniline (3-Nitroaniline)
p-Nitroaniline (4-Nitroaniline)
Nitrobenzene
o-Nitrophenol (2-Nitrophenol)
p-Nitrophenol (4-Nitrophenol)

Table G.2

N-Nitrosodi-n-butylamine (Di-n-butylnitrosamine)
N-Nitrosodiethylamine (Diethylnitrosamine)
N-Nitrosodimethylamine (Dimethylnitrosamine)
N-Nitrosodiphenylamine (Diphenylnitrosamine)
N-Nitrosodipropylamine (N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine)
N-Nitrosomethylethylamine (Methylethylnitrosamine)
N-Nitrosopiperidine
N-Nitrosospyrrolidine
5-Nitro-o-toluidine
Pentachlorobenzene
Pentachloronitrobenzene (PCNB)
Pentachlorophenol
Phenacetin
Phenanthrene
Phenol
p-Phenylenediamine
Polychlorinated biphenyls (PCBs; Aroclors)
Pronamide
Pyrene
Safrole
1,2,4,5-Tetrachlorobenzene
2,3,4,6-Tetrachlorophenol
o-Toluidine
2,4,5-Trichlorophenol
0,0,0-Triethyl phosphorothioate
sym-Trinitrobenzene

Organochlorine Pesticides[1] (USEPA Method 8081A)
Aldrin
α-BHC
β-BHC
γ-BHC (Lindane)
δ-BHC
Chlorobenzilate
α-Chlordane
γ-Chlordane
Chlodane – not otherwise specified
DBCP
4,4'-DDD
4,4'-DDE
4,4'-DDT
Diallate
Dieldrin
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde

Table G.2

Endrin ketone
Heptachlor
Heptachlor epoxide
Hexachlorocyclopentadiene
Isodrin
Methoxychlor
Toxaphene

Polychlorinated Biphenols[1] (PCBs, USEPA Method 8082)
Aroclor 1016
Aroclor 1221
Aroclor 1232
Aroclor 1242
Aroclor 1248
Aroclor 1254
Aroclor 1260

Organophosphorus Pesticides[1] (USEPA Method 8141A):
Chlorpyrifos
Diazinon
Dimethioate
Disulfoton
Ethion
Famphur
Malathion
Parathion
Parathion-ethyl
Parathion-methyl
Phorate

Chlorinated Herbicides[1] (USEPA Method 8151A):
2,4-D (2,4-Dichlorophenoxyacetic acid)
Dicamba
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
MCPA
MCPP
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)
Pentachlorophenol

1. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte per WDR Monitoring Specification G.14.